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| 10/586,971 | 05/03/2007 | Yasuhiro Suzuki | 46884-5501 | 6542 |

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| EXAMINER | |
|---|---|
| DANIELS, ANTHONY J | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2622 | |

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| 06/18/2010 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/586,971 | SUZUKI ET AL. | |
| | Examiner | Art Unit | |
| | ANTHONY J. DANIELS | 2622 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 May 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/21/2010 has been entered.

### *Response to Arguments*

Applicant's arguments regarding claim 1 and the cited art of record have been considered but are moot in view of the new ground(s) of rejection. However, the examiner would like to make the following comments regarding the amended features of claim 1. The marked-up version of Figure 1 of the instant application is appreciated by the examiner. However, Figure 1 is simply a schematic of the imaging array and nowhere in the specification is it mentioned that this drawing is to scale. Furthermore, the specification does not explicitly disclose that the length of the line through which the row selecting signal is provided is longer than that of the line through which the gate signal is provided. Applicant discloses on p. 2 of the specification, "…the line length for a row selecting signal, which is transmitted from the row selecting section to the pixels that constitute each row of the photodetecting section, is different from one row to another. In the case that the line length for a row selecting signal from the row selecting section to the pixels that form one row of the photodetecting section is long, since the line has a large resistance value and capacitance value, the waveform of the row selecting signal inputted into

the pixels that constitute the row is deteriorated." This passage does not necessarily imply that the row selecting signal line be longer than that of the gate signal line.

Also, the claim is broad in that it does not state between what two points the lines lengths are to be measured. Accordingly, any two points on the lines of Trevino can be chosen as the measurement points. However, the claim does recite that row selecting section output both the row selecting signal and the gate signal; a feature not taught by Trevino, necessitating the new grounds of rejection in view of Tay. It should be noted that the any two measurement points can be chosen in Tay as previously mentioned regarding Trevino.

### *Claim Rejections - 35 USC § 103*

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stark (US 2002/0186312) in view of Trevino (US # 6,856,349) in view of Tay (US 2003/0193594) and further in view of the Japanese Publication to Ogata (Japanese Publication Number: H03-027684).

As to claim **1**, Stark teaches a solid-state image pickup apparatus (Figure 6), comprising: a photo-detecting section having a plurality of pixels which are two-dimensionally arranged in M rows and N columns (M and N are integers of two or more) (Figure 6, unit cell array "102") and each of which includes a photodiode (Figure 1, "PD") and a cell switch (Figure 1, "TR"), and N lines $L_N$ provided in accordance with the respective columns of said pixels such that said associated photodiodes in said pixels that constitute the nth column (n is an arbitrary integer of one or more but N or less) are respectively connected to a line Ln via said cell switch corresponding to said associated photodiode (Figure 1, column line "12"; Figure 6, $Col_1$ - $Col_N$); an output section (Figure 6, video mux "110") which accumulates an electric charge that flows in through the line Ln into a readout circuit Rn (Figure 9, sense amplifiers "SA") and which outputs a voltage according to the amount of the accumulated electric charge from said readout circuit Rn via a switch SWn (Figure 1, switch "S"; [0040] – [0042]), said output section being arranged at a first-row side or an Mth-row side of said photodetecting section and including N readout circuits $R_1$ to $R_N$ and N switches $SW_1$ to $SW_N$ (Figure 9); a row selecting section (Figure 6, left line decoder "104") which outputs a row selecting signal $S_{A,m}$ for an instruction on switching of said cell switches in said pixels that constitute the mth row (m is an arbitrary integer of one or more but M or less) of said photo-detecting section (Figure 6, $LnRd_1$ - $LnRd_M$), said row selecting section being arranged at a first-row side or an Mth-row side of said photodetecting

section (Figure 6); a column selecting section (Figure 6, column decoder "124") that outputs a column selecting signal $S_{B,n}$ for an instruction on switching of said switch SWn in said output section (Figure 9; [0144]), said column selecting section being arranged at a first-row side or an Mth-row side of said photodetecting section (Figure 6). The claim differs from Stark in that **(1)** it requires a waveform shaping means for shaping, for each of the rows longer in distance from said row selecting section than a predetermined distance out of the M rows of said photodetecting section, a waveform of the row selecting signal $S_{A,m}$ outputted from said row selecting section and which inputs a shaped row selecting signal $S_{A,m}$ into said cell switches of said pixels that constitute the mth row of said photodetecting section, wherein the waveform shaping means shapes the row selecting signal in accordance with a timing of a gate signal provided as an input signal in the waveform shaping means. The claim further differs from Stark in that it further requires **(2)** that the row selecting section output the gate signal for shaping the row selecting signal and **(3)** that the length of a line through which the row selecting signal $S_{A,m}$ to be shaped is provided is longer than a length of a line through which the associated gate signal is provided. The claim lastly differs from Stark in that **(4)** it further requires that the row selecting section be configured so as to be substantially parallel with the column selecting.

In the same field of endeavor, Trevino teaches a prior art method of controlling readout of a CMOS imaging array (Figure 1), wherein a row decoder (not shown) outputs a signal (Figure 1, access 0-N) to a waveform shaping circuit (Figure 3, AND gate "8"). An auxiliary signal is output to the other input of the waveform shaping circuit (Figure 1, rowgen "12"), which outputs a wave-formed shaped signal to activate the pixels in a specified row (Figure 2, row0 – rowN and access 0-N) **(1)**. In light of the teaching of Trevino, it would have been obvious

to one of ordinary skill in the art at the time the invention was made include the waveform shaping circuit along with the auxiliary signal in the apparatus of Stark, because an artisan of ordinary skill in the art would recognize that this would provide uniform exposure time control as well as precise read and row select signals by keeping the access signal high throughout the reading and row selecting sequences.

Further in the same field of endeavor, Tay teaches a CMOS imaging sensing array and related circuitry (Figure 1). The circuitry includes a row decoding means (Figure 1, decoder "76" and phase sequence decoder "84") which outputs a row selecting signal (Figure 12, SEL "514") and a gate signal (Figure 12, output lines "Q0 and Q1") **(2)** both of which control the selection of a row of the image sensing array ([0074], Lines 6-12). Tay further shows that the length of a line through which the row selecting signal is provided is longer than a line through which the gate signal is provided (Figure 1, SEL longer than Q0 and Q1) **(3)**. In light of the teaching of Tay, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the access signal and the "rowgen" and "rstgen" signals of Trevino originate from a single row decoding means as discussed in Tay as well as providing a length of a line of the access signal longer than that of the "rowgen" and "rstgen" signals, because an artisan of ordinary skill in the art would recognize that this would provide a more compact CMOS array as well prevent interference between signal lines in close proximity to each.

Further in the same field of endeavor, Ogata teaches an image sensor including a horizontal scanning circuit and a vertical scanning circuit arranged substantially parallel to each other (see Abstract Figure and CONSTITUTION, Lines 1-12) **(4)**. In light of the teaching of Ogata, it would have been obvious to one of ordinary skill in the art at the time the invention was

made to arrange the row decoder and column decoder of Stark in the manner described in Ogata, because an artisan of ordinary skill in the art would recognize that this would allow reduce the longitudinal and lateral size of the image sensor chip by the width of the scanning circuits (see Ogata, Abstract, CONSTITUTION, Lines 12-15).

**Remarks about the rejection of claim 1: Considering Figure 3 of the present application, the examiner submits that the signal, $S_{A,1}$, is not shaped in its strictest definition. What the examiner discerns is happening is that the width of the pulse of signal is $S_{A,1}$, is shortened. Since $S_{A,1}$ is high throughout the gate signal's transition from low to high and from high to low, signal, $S'_{A,1}$, mimics the gate signal, thereby obtaining a shorter width not a different shape. This is precisely what is occurring in Trevino's Figure 2. Access signal 0-N (analogous to the signal $S_{A,1}$) is high throughout rowgen's (analogous to the gate signal) transition from low to high and from high to low. Consequently, the signal that is input to the row of pixels (analogous to the signal $S'_{A,1}$) mimics the rowgen signal, which has a shorter pulse than the access signal (i.e. waveform shaped as termed by the specification).**

As to claim **2**, Stark, as modified by Trevino, Tay and Ogata, teaches a solid-state image pickup apparatus according to claim 1, wherein said waveform shaping means shapes, for each of all rows of said photodetecting section, a waveform of the row selecting signal $S_{A,m}$ outputted from said row selecting section (see Trevino, Figure 2), and inputs a shaped row selecting signal $S_{A,m}$ into said cell switches of said pixels that constitute the mth row of said photodetecting section (see Stark, Figure 1; see Trevino, Figure 1).

As to claim **3**, Stark, as modified by Trevino, Tay and Ogata, teaches a solid-state image pickup apparatus according to claim 1, wherein said waveform shaping means is arranged, for each row of said photodetecting section, at either one end side of the row (see Stark, Figure 6, left line decoder "104"; see Trevino, Figure 3; see Ogata, Abstract and Drawing 1).

As to claim **4**, Stark, as modified by Trevino, Tay and Ogata, teaches a solid-state image pickup apparatus according to claim 1, wherein said waveform shaping means is arranged, for each row of said photodetecting section, at both end sides of the row (see Stark, Figure 6, left line decoder "104" and right line decoder "106"; see Trevino, Figure 1; *{The examiner submits that the addition of the AND gate of Trevino would result in the gates being provided for both the left and right line decoder; thus, locating the waveform shaping circuit on both sides of the row.}*).

As to claim **5**, Stark, as modified by Trevino, Tay and Ogata, teaches a solid-state image pickup apparatus according to claim 1, wherein said waveform shaping means includes a logic circuit that is inputted with the row selecting signal $S_{A,m}$ outputted from said row selecting section and that outputs a logic signal according to a level of the inputted row selecting signal $S_{A,m}$ as a waveform-shaped row selecting signal $S_{A,m}$ (see Trevino, Figure 1, AND gate "38"; Figure 2, row0 - rowN).

## ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. DANIELS whose telephone number is (571)272-7362. The examiner can normally be reached on 8:00 A.M. - 5:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anthony J Daniels/
Examiner, Art Unit 2622

6/15/2010